

IN THE CLAIMS:

Please AMEND claims 11-21 and 25 as follows. A marked-up copy of these claims is attached in Appendix A. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

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11. (Twice Amended) An optical system for use in a projection exposure apparatus, said optical system comprising:
a plurality of lenses having birefringence; and
at least one optical element for correcting the birefringence of said plurality of lenses.

12. (Twice Amended) An optical system according to claim 11, wherein said optical element comprises at least one optical member having predetermined form birefringence.

13. (Twice Amended) An optical system according to claim 12, wherein said at least one optical member is arranged so that a distribution, including a distribution of form birefringence produced by said at least one optical member, is effective to cancel the birefringence of said plurality of lenses.

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14. (Amended) An optical system according to claim 12, wherein said at least one optical member is arranged to produce form birefringence on the basis of a grating having a period smaller than a wavelength used.

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15. (Twice Amended) An optical system according to claim 14, wherein said grating

is provided on the surface of at least one of said lenses.

16. (Twice Amended) An optical system according to claim 11, wherein said optical

element comprises at least one optical member having a predetermined stress distribution.

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17. (Twice Amended) An optical system according to claim 16, wherein said at least

one optical member is arranged so that a distribution, including a distribution of stresses

produced by said at least one optical member, is effective to cancel the birefringence of said

plurality of lenses.

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18. (Twice Amended) A projection exposure apparatus comprising:

an illumination system for illuminating a reticle with light; and

a projection optical system for projecting a pattern of the reticle onto a wafer, said

projection optical system including a plurality of lenses having birefringence, and at least one

optical element for correcting the birefringence of said plurality of lenses.

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19. (Amended) A projection exposure apparatus according to claim 18, wherein said

illumination system illuminates the reticle with slit-like light, and further comprising a scanning

device for simultaneously scanning the reticle and the wafer in a widthwise direction of the slit-

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like light, at a speed ratio corresponding to a projection magnification of said projection optical system.

20. (Twice Amended) A projection exposure apparatus according to claim 18, wherein said at least one optical element comprises at least one optical member having predetermined form birefringence.

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21. (Twice Amended) A projection exposure apparatus according to claim 20, wherein said at least one optical member is arranged so that a distribution, including a distribution of form birefringence produced by said at least one optical member, is effective to cancel the birefringence of said plurality of lenses.

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22. A projection exposure apparatus according to claim 20, wherein said at least one optical member is arranged to produce form birefringence on the basis of a grating having a period smaller than a wavelength used.

23. A projection exposure apparatus according to claim 22, wherein said grating is provided on the surface of at least one of said plurality of lenses.

~~SUB~~ 24. A projection exposure apparatus according to claim 18, wherein said at least one correcting element comprises at least one optical member having a predetermined stress distribution.

~~C~~ 25. (Twice Amended) A projection exposure apparatus according to claim 24, wherein said at least one optical member is arranged so that a distribution, including a distribution of stresses produced by said at least one optical member, is effective to cancel the birefringence of said plurality of lenses.

26. A device manufacturing method including a process for printing a device pattern on a substrate by use of a projection exposure apparatus as recited in any one of claims 18 through 25.

Please ADD claims 27-29 as follows:

-- 27. An optical system for use in a projection exposure apparatus, said optical system comprising:

a plurality of optical elements including lenses each having birefringence, said plurality of optical elements being arranged so that the birefringence can be corrected as a whole.

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28. A projection exposure apparatus comprising:
an illumination system for illuminating a reticle with light; and
a projection optical system for projecting a pattern of the reticle onto a wafer,
said projection optical system having a plurality of optical elements including lenses each having
birefringence, and said plurality of optical elements being arranged so that the birefringence can
be corrected as a whole.
29. A device manufacturing method, comprising the steps of:
exposing a wafer to a device pattern by use of a projection exposure apparatus
as recited in any one of claims 18 through 25 and 28; and
developing the exposed wafer. --

REMARKS

Applicant requests favorable reconsideration and allowance of the subject application
in view of the preceding amendments and the following remarks.

Claims 11-29 are presented for consideration. Claims 11, 18, 27 and 28 are
independent. Claims 11-21 and 25 have been amended to clarify features of the invention, while
claims 27-29 have been added to recite additional features of the invention. Support for these
changes can be found in the application, as filed. Therefore, no new matter has been added.